

Executive Summary

Communications capabilities for public safety first responders are taking significant leaps forward. The Nebraska Homeland Security Communications Strategy has promoted a process to assess capabilities and prioritize the use of limited federal grant funding to achieve the greatest impact possible. This is an ongoing endeavor as the state continues to further the communications strategy through local collaboration, regionalization and state oversight of planning standards.

The state is achieving its objectives by enhancing communications systems through the regional coordination strategy. The Nebraska Emergency Management Agency and the Department Administrative Services Division of Communications developed the state strategy in coordination with the State Homeland Security Policy Group and the Regional Interoperability Advisory Board that was created in the 2005 legislative session. As you read this information, keep in mind that former definitions and expectations have changed. It is no longer a question of having the “right system” or a particular “technology standard.” What has emerged holds far more importance and impact – it is the culture of interoperability that is driving new definitions and standards for interoperable communications.

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The Nebraska Blueprint for Interoperability

Nebraska has changed the definition of “interoperable communications system.” Just as there are **no cookie-cutter plans for constructing roadways, there are also no “canned approaches” for communications systems to achieve interoperability.** Nebraska has adopted a planning approach that integrates systems regionally and establishes a foundation for integrating the state communications system regionally.

Why is this distinction important? Compatibility has less to do with the technology of a communications system and more to do with how agencies use their system. If we look at how roadways are designed and built, we see a variety of shapes, sizes, materials and technologies in use. **When a new technology comes along we do not declare all previous roadways to be “obsolete.”** Instead we **integrate** newer roadways with older ones – a system of roadways. Likewise, as new technologies emerge, those technologies can be adapted to a set of defined user needs – defining what a system needs to do – **creating a “network of regional systems.”**

Planning standards ensure that a defined level of interoperability can be achieved and sustained. Without persistent planning standards the resulting consequence is that technology drives the definition of interoperability and user needs fade into the background. In the Nebraska Interoperability Blueprint planning standards ensure that an ongoing understanding of public safety needs is the priority, not changing technologies. Interoperability is a management problem, not a technical problem.

Technology standards are important and beneficial to the interoperability discussion because technology allows systems to evolve and improve over the course of the system life cycle. Technology standards are used within the established communications interoperability definitions. Without a deliberate and persistent planning strategy, we will repeat past mistakes and allow entropy – lack of planning – to erode the progress we have made. **Applying a continual strategy of regional planning and statewide systems integration will ensure the most effective use of public resources and achieve the necessary level of interoperability across the state.**

Interoperability is a management problem, not a technical problem.

The Regional Communications Network

Organizing all 93 Nebraska counties into regional areas across the state allowed the state to leverage **areas of common interest**. Homeland Security grant funding served as a catalyst to correcting many of the problems associated with aging communications systems and practices. Regionalizing communications areas is an effective planning tool for coordinating communications projects across the vast and diverse geography of the state. The Governor's Homeland Security Policy Group made interoperable communications a statewide priority regardless of population or location. Therefore, NEMA and DAS-Division of Communications began a concerted statewide effort in the spring of 2004 to coordinate interoperability planning for equipment expenditures.

Since the initial planning effort, many counties have made significant progress in upgrading their systems and linking their capabilities. Although much progress has been made, this is an ongoing effort and will continue through the overlapping federal grant cycles. The most significant outcome of this effort is that **all regional communications systems will have improved dramatically**. This is no small task and will require the ongoing attention of state and local leaders to see that progress does not fall back into those of haves and have-nots. It is no longer acceptable that communications jurisdictions do not coordinate and plan for the long term improvements of their capabilities. By establishing a solid foundation to build on, long-term costs can be minimized while continually improving communications capabilities.

This foundation is being established through upgrading the county communications infrastructures and the interconnections to their neighboring counties. Grouping counties regionally enables the state to set communications benchmarks to coordinate larger geographic areas of the state. These benchmarks form the expectations and guidance for the level of communications capabilities targeted.

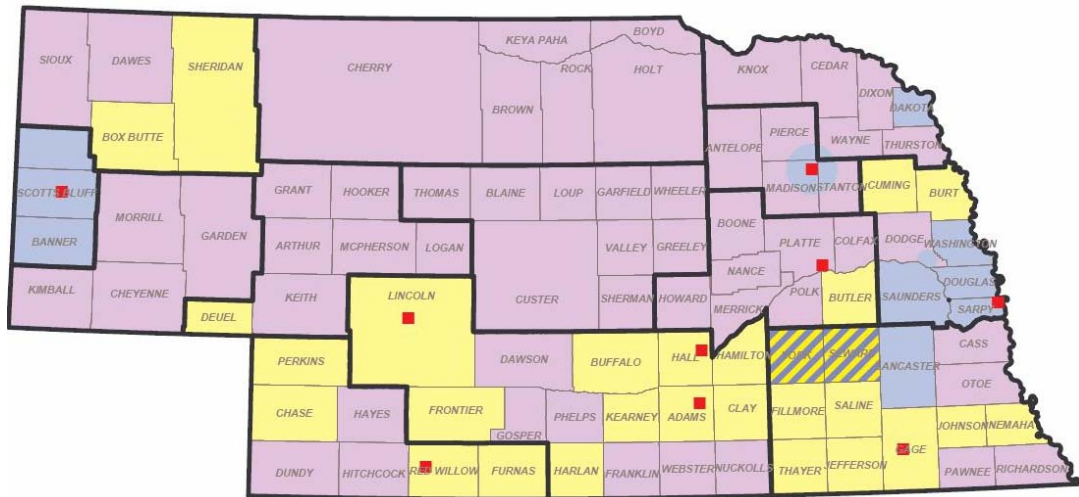
- Management planning and control of communications resources
- Dispatch resources and interconnections to surrounding systems
- Overlapping radio coverage areas and frequency sharing
- Network connections for wide area notification and response
- Technology standards and system life cycle migration strategies

Fitting Together Regional Communications

Regional planning areas form the vision of how the state is integrating capabilities to establish statewide interoperability. The state communications system, coupled with regional communications systems, creates a functional and sustainable network at the local and state level. Interoperability is available between public safety radio users when the need and desire to communicate is there.

**“....benchmarks form the expectations and guidance
for the level of communications capabilities targeted.”**

Regional Planning Areas and MOU Cities



Integrating regional communications areas involves more than just connecting communications systems. We are dealing with a network of regional system capabilities, so it's **critical to define what levels of interoperability can be provided to others in need during a major incident.** This is a non-technical assessment of assets that can be provided and serve a diverse set of communications needs for the duration of the incident. Technical details and configurations are pre-established in a planning phase that includes inter-local agreements, technical documentation and functions, deployment guidelines and operational specifications.

Communications assets must be maintained and exercised. An ongoing assessment of capabilities and deficiencies reveals areas needing improvement. It is the responsibility of each participating region and local jurisdiction to constantly plan for and improve their capabilities and contractual relationships – inter-local agreements, memorandums of understanding (MOUs), governance, financial support, etc.

The State of Public Safety Communications

Local communications systems across Nebraska are undergoing stages of enhancements. The majority of federal grant dollars has been targeted toward meeting specific interoperability goals for local communications systems. Most local communications systems were found to be adequate for responding to many local emergencies. However, **larger and expanding emergencies revealed deficiencies in the ability to share resources and coordinate.** Regional communications needs were targeted to fund improving local capabilities into regional capabilities. **Regionalizing communications is solving the need for wide area response capabilities.**

State communications systems have not yet experienced the same level of upgrade as many local communications systems. State agencies continue to operate on communications systems that need to be modernized. Under the homeland security communications strategy, the state communications system will integrate into regional communications systems as a peer region and fit into the goals of the statewide interoperability strategy.

The state communications system plan assesses available assets and establishes technical and operational requirements. The state will conduct a bid process for the system and its implementation. Homeland security grants are also assisting in funding the system. The system will consolidate state public safety first responders onto a common infrastructure with the capability to tie into regional communications systems as needed.

First responders at the local, state and federal levels will link through dispatch operations and shared radio resources for mutual aid. The network of regional systems – including the state system – will interconnect through a statewide network that provides incident commanders with the resources to communicate as needed. The critical path to interoperability is a **standard training and control structure to properly use and manage communications assets.**

The state of communications systems in Nebraska can accurately be described as more coordinated and focused than it has been in decades. Prior to the beginning of the regional communications strategy in 2004, systems were in varying states of disrepair and adequacy. There was little guidance occurring on both the state and local levels to create a uniform statewide strategy for communications. Since the 2004 grant cycle began, state and local planning efforts have accomplished the following:

- Formation of 13 regional planning areas that includes all 93 counties
- Defined enhancement goals for targeting the use of grant funding
- Reviews and approvals of all communications expenditures
- Review of county level progress and regional goals
- Creation of a Regional Interoperability Advisory Board to assist the state

Regional Interoperability Advisory Board – LB 343 (2005)

The Nebraska Legislature acted in 2005 to create an advisory board to assist the Department of Administrative Services Division of Communications in coordinating the current interoperability efforts. The authority for the Regional Interoperability Advisory Board is referenced in Revised State Statutes 86-401 to 86-418.

“The division shall **develop and adopt technical and operational standards** for any communication system acquired, developed, constructed, or replaced by any state agency or any city, county, village, public power district, fire protection district, or other political subdivision, including joint entities and joint public agencies created pursuant to the Inter-local Cooperation Act or Joint Public Agency Act.”

“The Regional Interoperability Advisory Board is created. **The board shall provide advice to the division regarding the formation, expansion, and enhancement of regional communication systems to achieve interoperability.**”

The Regional Interoperability Advisory Board produced **four major goals to promote and facilitate communications interoperability**. The goals are designed so that interoperability moves beyond a temporary planning effort and progress continues indefinitely. Communications interoperability is a culture that must be sustained beyond current individuals, priorities, systems and technologies.

Goal #1: Assist in the formalization of the interoperable communications regions.

Interoperability needs contractual relationships between government entities for it to survive changing conditions and priorities. The inter-local agreement is the glue that holds a plan’s original intentions together. Member jurisdictions carry their financial responsibilities and areas of command and control to accomplish their stated functions. Inter-local agreements become the binding contracts that establish the rights and privileges of each participating entity to provide capabilities and receive from the interoperability arrangement.

A key element to success is that all parties to the Inter-local Agreement are fully educated on its intent. MOUs can be used for the more detailed or onsite arrangements supporting the inter-local agreement. Preplanning defines the circumstances surrounding an event - what to do, how to do it and when to do it. The success of any response lies in the preparation and planning in advance.

Interoperability is more governance oriented than technology oriented.

People desiring to work together must recognize the “culture of interoperability.” **There is no “system” of interoperability outside the culture of people working to create it and promote its ongoing development.** Interoperability is more governance oriented than technology oriented.

Goal #2: Advocate ongoing assessment of communications capabilities, resource sharing and strategies.

The state's natural interest and expertise in communications should be leveraged to **provide a lasting structure** so that these goals can be accomplished.

We have learned these lessons:

- Public safety communications is an on-going endeavor
- Successful agencies continually assess their assets and deliberately plan
- Public safety communications is much more a culture than a technology

NEMA and DAS-Division of Communications have collaborated with the Governor's Homeland Security Policy Group to create an ongoing communications strategy covering the need for improving capabilities statewide. The strategy established a defined level of capabilities and targeted grant funding to not only build and enhance public safety communications, but to ensure fiscal responsibility and that the enhancements are sustainable into the future.

It is not enough to upgrade capabilities without the ability and will to sustain it. The statewide communications strategy establishes a foundation to build on. The new challenge for interoperability is not a question of systems and technologies, but how to promote an ongoing culture that keeps the progress moving forward.

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Recommendations

- The state's role is to serve as a repository of systems, technologies and capabilities and to continually advance planning efforts for communications interoperability.
- A state maintained database of communications officers, contacts and detailed assessments of resources.
- State sponsored annual conference where best practices are highlighted and information sharing is facilitated.
- Annual review and presentation of the "State of Communications" conducted by the state and coordinating entities.
- An assessment tool that local agencies can use to evaluate the current status of their communication infrastructures.
- Create a common interoperability plan for mutual aid frequencies statewide.

Goal #3: Provide guidance to integrate state public safety agencies as a peer region into the network of statewide communications capabilities.

Two realities have emerged for communications in Nebraska. First is that regions tend to naturally exist and have coalesced, and in many cases have developed significantly enhanced communications capabilities. Second is that state public safety agencies, State Patrol, Game and Parks Commission, and the State Fire Marshal's Office have not evolved forward – and in many ways state agencies have become more isolated. Because the state lacks a modern communications system, one solution has been for local jurisdictions to loan radios to state agencies so they can operate on local systems. The City of Lincoln is one example of this. This is a reoccurring theme that plays out continually across the state.

The state must adopt a modern two-way repeated radio system with digital capability.

The state lacks the “operable” capability needed to “interoperate” with other agencies – and is also limited in its ability to adequately provide for its own needs. This divide will only increase if the state does not improve its communications capabilities – individual regions and localities will continue to improve their capabilities. The Regional Interoperability Advisory Board has concluded that a fundamental change in thought process needs to occur. It is imperative that the state public safety agencies be viewed as a peer region, no different than any other region in the state. By using this outlook it is possible to examine what is needed to equip the state public safety agencies to respond as a true peer with their local partners to the events that confront us. The state must adopt a modern two-way repeated radio system with digital capability.

GOAL #4: Promote an on-going understanding, coordination and allocation of communications resources available to respond to a disaster.

The state and regional areas must define what level of interoperability is needed to coordinate and respond to events. The real task now is deciding what level of interoperability is needed, how to achieve it, how to maintain it, and to use the capabilities. Since the advent of the Department of Homeland Security Department (DHS), the responsibility to implement programs has been placed on the state. Every state must determine how it will support and manage the requirements of Homeland Security to enhance the protection provided to its citizens, and to maintain a capability to respond to terrorism and disasters.

Command and control of resources is the number one priority for DHS. This is evidenced by requirements to have first responders and coordinators trained in the National Incident Management System (NIMS). Incident Managers must ensure that effective interoperable communications processes, procedures and systems exist across all agencies and jurisdictions. Interoperability is not an ambiguous or controversial term. It must be defined, and more importantly, there be a definition for what the finished result looks like to set realistic goals.

...technology is not the key. The Plan is the key to interoperability.

It is a necessity to have collaboration on a regional basis – to leverage expertise, share specialized assets, enhance capacity and interoperate cohesively and effectively. Clear plans for responding to natural disasters, disease outbreaks or terrorist attacks must be in place in order to promote an on-going understanding, coordination and allocation of communications resources.

The needs of local communities dictate the level of need to share information and ensuring clear communications between authorized users, across disparate geographic locations, networks and technology when the need arises. Moreover, technology is not the key. Technology does not drive the solution – it is the needs of the local communities to respond to an emergency or disaster. The plan is the key to interoperability. The regions have to determine what is needed to respond, who is going to respond, how they are going to respond, where they are going to respond and how everyone will integrate into a unified approach for an emergency or a disaster. To be successful in achieving interoperability, the regions must know how interoperability is defined.

The State Communications System Plan

Defining the state communications system is a regional consideration and a statewide jurisdictional issue. The state strategy defines the state as a peer region to the other regions across the state. This strategy determines how the state fits into regional communications capabilities. State agencies need a modern communications system – a system plan has been developed by DAS-Division of Communications. The state communications system plan details the timeline and funding needed. The system provides state agencies interoperability with regions and a foundation for future growth.

Nebraska Communications Systems by County Land Area and Population, including 2005 regional projects

Frequency	Population	Land Area
150 MHz	23.3%	64.3%
450 MHz	19.3%	28.6%
800 MHz	57.4%	7.1%

Two-frequency system 150/800 MHz offers the greatest level of compatibility

150 MHz/800 MHz System	80.7%	71.4%
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Statewide compatibility is more than the ability to talk on the same frequency. The state system must also connect to regional systems to share critical information and coordinate during incidents. The above table shows county systems by frequency, population and geography. The state system plan coordinates with regional systems to integrate the state with regional interoperable capabilities and shared mutual aid frequency resources.

The state communications system plan achieves statewide interoperability through:

- Regional frequency compatibility and local dispatch connections
- Mutual aid frequency plan ties together state and regional systems
- Backward compatibility of state user radios to older state radio equipment
- Allowing for future growth and system enhancements

Timeline for state and regional system phases

System projects & planning	FY05	FY06	FY07	FY08	FY09	FY10
Tower revitalization & frequencies		Towers/Frequencies				
Infrastructure & tower equipment			Tower Equipment			
Agency radio equipment & migration					Agency Equipment	
Regional planning and grant projects	Regional Communications Projects					
Statewide mutual aid implementation		Mutual Aid Plan				
State and regional systems integration					Statewide Integration	

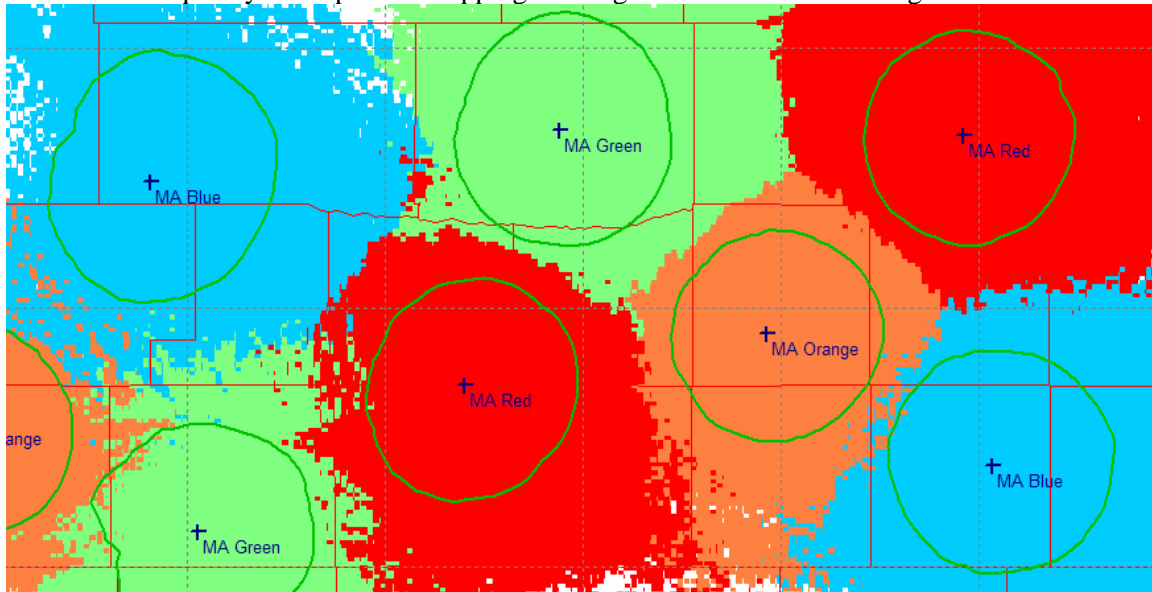
The timeline above outlines the statewide progress for regional systems and the state communications system. As described previously, the **three major parts of the state communications strategy includes developing regional communications systems, the statewide mutual aid frequency plan, and the state communications system plan.** All three initiatives are coordinated in the state strategy to create the statewide interoperable communications network.

Mutual Aid Frequency Plan

The mutual aid frequency plan is part of the regional communications strategy that creates an interoperability overlay to the developing regional communications systems. Dispatch centers tie into the mutual aid radio sites, which can then connect county and regional communications to the shared mutual aid assets. The mutual aid frequencies provide a shared resource during incidents for dispatch operations and tactical events.

A coverage concept is illustrated below. Coverage is based on using available towers and connecting area dispatch centers to the radio sites. The plan is based on frequency reuse and channel assignments – this simplifies operational use and allows coordinated expansions to the system.

Mutual aid frequency concept – overlapping coverage areas and channel assignments



The mutual aid plan is complementary to the regional communications systems – it does not require replacing existing systems that may already function well. The system adds a **shared resource to support jurisdictional and regional interoperability**. The basic operation of the system provides:

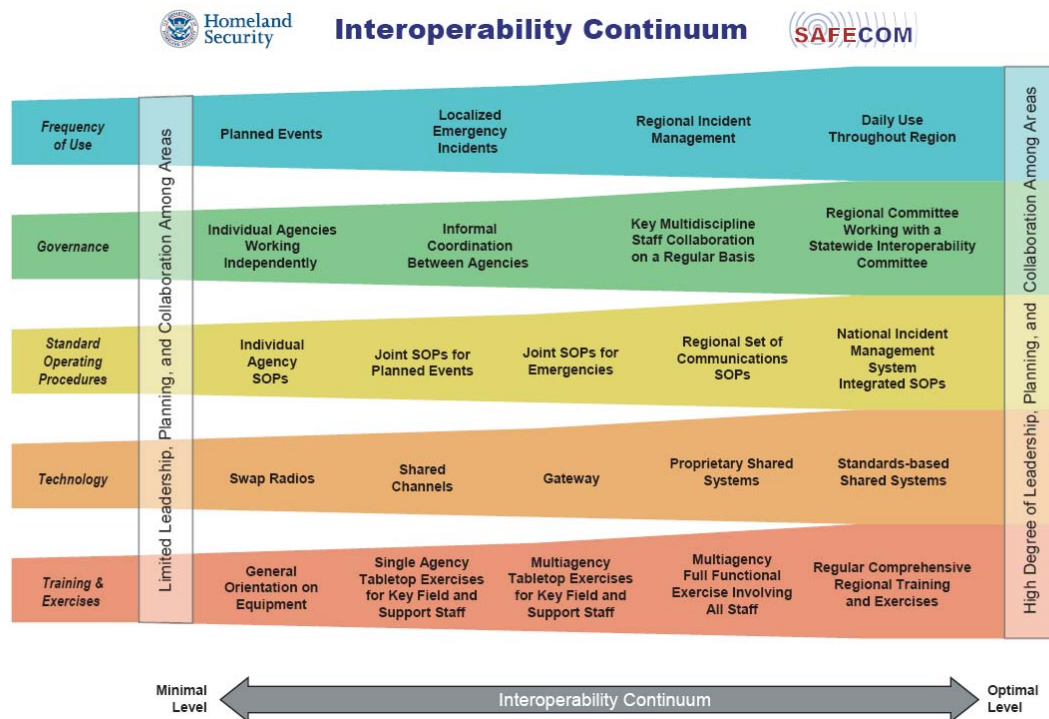
- Overlapping coverage beyond county-owned communications assets
- Level of integration between regional communications systems
- Level of interoperability for statewide roaming

The mutual aid plan establishes 150 MHz and 450 MHz coverage areas and channel assignments to complement the regional communications systems. The mutual aid frequency plan also addresses 800 MHz and 30 MHz (low band) interoperability so that all public safety spectrum resources are accommodated in the coordination plan. **As communications systems adapt to changing technologies and regulatory impacts, there is an ongoing coordination effort of public safety frequency planning to ensure interoperability is continually improving** and does not fall back into piecemeal planning.

Assessing Statewide Interoperable Capabilities

The statewide regional communications plan coordinates state, regional and urban areas into a unified strategy. Integration of regional systems defines the capability of regions and the state to provide interoperability under defined conditions. The capability levels defined for communications systems determine their need to upgrade and sustain their capabilities. The Homeland Security Interoperability Continuum identifies levels of planning, collaboration and leadership to measure capabilities. The continuum does not suggest what level each area need to attain, but it does establish a measurable comparison of capabilities within the interoperability categories. The continuum is **a tool to define communications priorities and communicate how the state and regional jurisdictions address their interoperability requirements.**

No system is ever “finished” – every system must be maintained and upgraded periodically. Each new system enhancement must consider what changes will continue to improve interoperability. The Interoperability Continuum is a useful reference to consider what levels of interoperability require supporting for ongoing systems planning.



The statewide communications strategy targets the following levels of capabilities. These are all at the high end of the continuum for leadership, planning and collaboration.

- Frequency of Use – Regional Incident Management and Daily Use
- Governance – Regional Committee/Statewide Interoperability Committee
- Standard Operating Procedures – Regional Communications SOPs & NIMS
- Technology – All levels of capabilities are integrated within the state strategy
- Training & Exercise – Time-period specific to regional areas and SEOP

The state communications plan and regional coordination strategy is achieving these levels of target capabilities through grants coordination and state investment in its communications capabilities. Targeting defined interoperability levels and specific communications enhancements sets benchmarks where deficiencies can be defined, measured and resolved.

- Communications systems require ongoing priorities that are set by elected and appointed officials.
- Technical coordination that includes planning for interoperability and standards
- Life cycle considerations for costs, maintenance and migration strategies

In the Nebraska Statewide Communications Strategy, the Governor's Homeland Security Policy Group and NEMA have set the agenda for creating statewide interoperability and the means to accomplish these goals. DAS-Division of Communications is supporting the state guidance and providing technical assistance to the county and regional communications planning efforts.

Throughout the 2004 and 2005 grants process, an enormous amount of coordination has taken place between local and state public safety officials. Although the complexity of interoperability is significant, the planning and technical coordination has produced a much greater level of understanding concerning communications interoperability, how to achieve it, and just as important, how to sustain and continually improve it.

Conclusion

Political leaders from every part of the state recognize there is a need for interoperability. The Nebraska strategy and blueprint for accomplishing these goals has been under continual development. The strategies and plans outlined in this brief establish the methods by which Nebraska is accomplishing these goals. Sustaining and periodically enhancing interoperable communications is also a commitment to the ongoing support of these goals.

Nebraska has adopted a regional communications strategy for reasons of economies of scale and the common interests shared in many areas of the state. This has served as a foundation for regionalizing Nebraska's homeland security funding effort and for coordinating the long-term interests of the state in continuing the progress. The state strategy is designed to illustrate that there are many alternatives and approaches concerning public safety communications and interoperability, but also that the chosen direction requires a level of commitment that will best serve the interests of public safety first responders and the tax payers who support them.